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Overseas Trading Corporations Established

THE Finance Bill, which was published last Tuesday, is a formidable bit of work mostly made up of the provisions for establishing the Overseas Trading Corporations. A good deal of overtime has been worked this week in the City in an effort to plumb its possibilities, and the telephones have been busy with opinions of eminent counsel. This is not a Bill for snap judgment, and we shall not try to make one. Also, it is important to realize that this is a Bill and not yet an Act. It is unlikely to go unamended. The Labour Party, ever reluctant to believe that money can be made to work, will be busy plugging "gaps", real or imaginary; the government will be anxious to see that the Bill can in no way be construed as an export subsidy (against which it has firmly set its face) an anxiety which appears mainly responsible for limiting its cost to about £35,000,000 in a full year, whereas the previous Chancellor hinted last year that it might cost something nearer double that amount.

Companies trading wholly abroad will be able to qualify as an O.T.C., and be exempt from income and profits tax in so far as they do not distribute their profits. Dividends paid to member-companies will rank for tax on these member-companies unless they themselves are also O.T.C.s. A holding company of one or more O.T.C.s can itself be an O.T.C., and this will enable it to switch profits from one overseas operating company to another without incurring tax on cash passed through London.

Each year an O.T.C. will have to have its standing reasserted. With certain limited exceptions, all that an O.T.C. is allowed to do in London is to manage; one of the exceptions that will help some mining companies is that O.T.C.s will be able to use the London terminal markets without losing O.T.C. status. But, in general terms, if the London company does more than manage, it seems incapable of ranking as an O.T.C. This may prove to be a difficult point. (Metal mining has so declined in Britain that "mining", as far as London goes, means mining in overseas enterprises. It remains to be seen whether the fact that O.T.C.s might lose their status if they went into mining in Britain will, in the end, militate against a substantial revival of domestic mining. On a first reading this appears to be so. For the present this is, however, an academic point, since a substantial recovery in domestic metal mining requires other reforms of taxation that still seem a long way off.) Furthermore, it seems that mining investment houses will have to rearrange their affairs and hive off their security dealings if they are to benefit. This is, perhaps, the most difficult section of the Bill and, incidentally, the one on which Parliamentary wrangling may develop.

An important section for the mining industry, and a welcome surprise, since the Chancellor did not reveal this in the Budget debates, is that non-residents of the United Kingdom, or people for some reasons not subject to United Kingdom income tax, will be able to get back the tax paid on their dividends from an O.T.C. The main purpose of this section is not to discourage foreign investors, and it will be particularly valuable, where for straightforward financial reasons it is desirable or imperative to work with

foreign capital. But it will also be important in mining enterprises where, for political reasons, it is felt desirable, or in some countries may be compulsory, to associate capital from the country where the mine is situated with the British capital which may be involved in exploiting it. The idea that minerals must not be wholly exploited by foreign capital is growing in many under-developed countries and this section will be helpful to meet this sort of difficulty.

Since the Bill comes into effect from April 6, 1957, the firm that can already claim to be an O.T.C. according to the terms of the Act, may command immediate benefit. Others may have to undergo some reorganization before they can qualify, and they might be well advised to await the final passage of the Act before entering on these paths.

Two final thoughts. The first is that traditionally mining enterprises have had to pay out higher than average dividends to secure the capital for what are generally very much higher than average risks. The Finance Bill will tend to encourage the ploughing back of profits, since only the undistributed profits, in general, would be free of tax. It remains to be seen how, over the years, this pressure will tend to alter the standing of mining enterprise shares. The second thought is that the annual reassertion that a company is, in fact, an O.T.C. is going to require some considerable investigations by the tax authorities. It is to be hoped that the authorities will consult industry on how these investigations can best be made. One does not want to see the tax benefits dissipated on the production of reams of paperwork, and on the wasting of many clerical man-hours.

GROWING MARKETS FOR LEAD

Speaking at the annual meeting of the Lead Industries Association in Chicago, Mr. B. B. Steiner, president of the Association of American Battery Manufacturers, Inc., predicted that 387,000 tons of lead would be used in the U.S. for storage batteries in 1957. This figure is an increase over the 366,000 tons used last year. It is based on an estimated production of 34,983,000 automotive type batteries, with 35,000 tons of lead used for industrial type batteries. The estimate for automotive type batteries is an increase of a little more than 2,000,000 over 1956.

Data gathered by the Association indicate that the average life of automobile batteries has been as low as 16.3 months and as high as 27.6 months since 1940 with the longest life prevailing in 1956. The average automobile battery weight is placed at 20.11 lb. In discussing the trend toward 12 v. rather than 6 v. batteries in automobiles, Mr. Steiner stated that all new passenger cars in the U.S., with the exception of the Willys Jeep, are now equipped with 12 v. batteries. On the basis of total registrations 12 v. batteries have increased from 0.7 per cent in 1953 to 9.2 per cent in 1956, and it was predicted that the weight of lead per battery would increase as the 12 v. battery becomes more predominant.

Combating atomic radiation was the subject of a talk by Dr. C. E. Crompton, associate technical director, National Lead Co. of Ohio, formerly connected with the Atomic Energy Commission, which covered design criteria and market possibilities for lead and other materials of shield construction.

Dr. Crompton stated that lead's attenuation of gamma rays from reactor-produced radioisotopes and radiation from reactors themselves accounts for the major use of this metal as protection for both staff and equipment. Other uses ranged from housing of radiation sources in cameras for industrial radiography and medical therapy, to mobile high-fission product sources for food preservation.

Peacetime distribution and use of radioactive isotopes which continues to increase at a rapid rate will account for 1,000 tons of lead per year by 1964, although this may be overshadowed by shipments of used reactor fuel elements for reprocessing slated to require 2,000 tons per year by 1964 and 4,000 tons per year by 1975.

For reactor shielding, particularly mobile propulsion and "package" power reactors where a premium is placed on minimum weight and space, requirements for lead may be between 5,000 and 10,000 tons per year by 1965.

Operating research reactors in the U.S. are expected to reach 54 in number by 1960. Shield requirements for 1964 would appear to be approximately 1,000 tons of lead per year. It is interesting to note that a research reactor complex carrying out testing work in its hot cells requires some six tons of lead per year to shield gamma-emitting waste materials destined for disposal in the ocean.

In conclusion, Dr. Crompton stated that "we can look to the entire nuclear industry as a growing market for high-density materials and aggregates. In 1964 lead consumption may reach 10,000 to 15,000 tons per year. . . . With nuclear power contributions more than doubling every 10 years we may expect this consumption of shielding materials to increase accordingly". He further estimated that some 26,000 to 28,000 tons of lead are currently in use in the atomic energy industry.

Dr. Alex Stewart, director of research, and Hugo J. Ratti, head of new products development, National Lead Co., described new applications that are being made of old lead compounds and new lead compounds that are being used in increasing amounts. The following examples were given: New lead pigments supplementing white lead, red lead, the chromates, and basic sulphate in paints; lead compounds to stabilize chlorine-containing thermoplastic resins such as polyvinyl chloride and vinylidene chloride plastics; lead-curing agents for thermo-setting plastics such as Hypalon; heat-sensitive lead compounds for telegraphic and radio communications which enable a receiving instrument to reproduce words, pictures and maps at some distant point accurately and instantaneously; shielding materials for protection against X-ray and all other types of destructive radiation, using both organic and inorganic lead compounds where a fluid protective barrier is desirable; and ballistic modifiers, an important use but one which cannot be discussed because of security reasons.

Discounting the last three classifications, which could be large but difficult to estimate in volume at present, it appears that in the U.S. new lead pigments in paints can reach a total of 30,000 tons per year within the next few years. By 1965 stabilizers for chlorine containing plastic materials will approximate 15,000 tons, whereas depending on volume growth of rigid plastic pipe and sheathing, another 10,000 tons of these lead compounds should come into use by 1970 to 1975.

It was also stated that new products will continue to be derived from over 700 lead compounds available to-day.

In tracing the history of tetraethyl lead fluid used in modern gasoline, Dr. D. P. Barnard, research co-ordinator, Standard Oil Co. (Indiana), and former Deputy-Assistant Secretary of Defence, Research and Development, predicted that the use of tetraethyl lead as an anti-knock will continue along established lines for the foreseeable future.

In reporting on current research and development on the use of lead in ceramics such as porcelain enamels, glass, glazes, and electronic and other ceramic bodies, Dr. John Koenig, director of the School of Ceramics, Rutgers University, "concluded without question that in addition to the many established uses for lead in ceramics, by far the greater part of all new ceramic developments in the low temperature field will involve the use of lead compounds".

He emphasized the increasing interest of the ceramic industries in low temperature ceramics.

MULTI-METAL MINING

Progress in extractive metallurgy has profoundly affected the economics of mineral and metal production by leading to the recovery of valuable materials which, in the past, were lost in the waste residues from treatment plants or in the gases discharged from smelting works.

This trend is well illustrated by some observations made by Dr. John F. Thompson, chairman of International Nickel, at the company's annual meeting. Dr. Thompson recalled that at the time of Inco's formation, 55 years ago, practically all the company's production consisted of nickel and copper. Minor amounts of the precious metals were also produced. The rest of the components of the ore mined were for the most part rejected in waste rock and slags or lost in gases.

While this was a wasteful procedure from one point of view, it was a necessary one, since the metallurgical art had not progressed to the point where these products could be separated profitably, or even—in some cases—separated at all. As a result, practically all the gold, silver and other precious metals such as platinum, palladium, iridium, ruthenium and rhodium were wasted or were recovered in part in the nickel and sold without the company receiving any recompense for them. Selenium, tellurium and sulphur were discharged in the waste gases. Cobalt either went into the slags or was part of the nickel sold. Iron was rejected in slags.

In the course of time, extraction methods were developed which permitted at least a partial recovery of some of these materials. Changes in demand also provided a market for some elements which were deleterious impurities.

To-day, 14 elements are recovered from Inco's ores. The more complete recovery of these elements is one of the factors weighed in every consideration of metallurgical change. Sulphur, which until 1930 was burnt in the open air, is now in part being sold to other concerns for use in the manufacture of sulphuric acid and liquid sulphur dioxide. Extensive experiments are under way to determine whether it can in the future be recovered economically in its elemental form.

The benefits of increased by-product recovery are, of course, two-fold. In the first place, the additional revenue derived from the sale of by-product materials can be offset against the cost of recovering the main metal, which can thus be sold at a more keenly competitive price. By-product recovery must obviously be a factor of critical importance in Inco's own policy of stable nickel prices.

Secondly, conservation of materials by more efficient extraction methods is a gain of inestimable value to a metal-hungry world whose resources, however vast, are by no means limitless. Furthermore a number of the materials so recovered have combinations of properties which are desirable for some newer requirements of technologists.

Despite the very great advances in extractive metallurgy which have been made in the past fifty years, much still remains to be achieved before the potentialities of by-product recovery are fully realized.

This point has been made by Dr. Thompson, who states that, on the basis of Inco's knowledge at this time, there are no further elements to be recovered from the company's present known ores, but the future holds promise for the recovery of greater quantities than are being recovered to-day.

HIGH AUTHORITY'S FIFTH ANNUAL REPORT

With another ten months of the five-year transitional period still to run, the creation of Western Europe's common market in coal and steel is now almost complete. The Fifth Annual General Report on the Community's activities, published this month, states that the only major task unlikely to be completed before the end of the transition period is a thorough reorganization of the Belgian coal industry.

The outstanding achievement of the European Coal and Steel Community has undoubtedly been the 36 per cent rise in steel production since the inception of the common market in 1952, and the Pool countries now produce rather more than 20 per cent of the world's steel. Notwithstanding rising coal output, the Report stresses the structural deficit of coal in the Community, despite an increase of 4.2 per cent in production between 1952 and 1956, bringing the output for the latter year up to 249,000,000 tonnes. Consumption, however, is increasing at a still faster rate and in 1956 38,000,000 tonnes were imported—80 per cent coming from the U.S.A.

Surveying in detail the long-term objectives of the Community, the Report indicates that steel production should rise to 73,500,000 tonnes by 1960 and to 86,000,000 tonnes by 1965. Coal needs are estimated as being 308,000,000 tonnes by 1960, 332,000,000 by 1965 and 362,000,000 by 1975.

Investment policy has already been shaped to meet these various needs, although the coal industry faces serious problems in this respect. Investments totalling some \$1,687,000,000 for the three years 1957-59 had already been notified to the High Authority at the beginning of this year. This coal financial programme, although substantially greater than actual investment in the preceding three years (\$1,271,000,000), is far from adequate to achieve the required rise in output according to the report of the High Authority.

PROSPECTING IN CAPE YORK, AUSTRALIA

The sensational discovery of bauxite on the west coast of the Cape York peninsula, Australia, has promoted an active interest in this remote region. This interest extends not only to bauxite.

Amongst the large mining groups active in the area is the Broken Hill Proprietary Co., at present conducting a widespread search for iron ore. However, bauxite remains of paramount importance in Cape York, and forecasts of possible exports are placed in the region of 1,000,000,000 tons. The discoverers of the area's potential mineral wealth, Consolidated Zinc and its subsidiaries, have not given any estimate of the deposits existing in their areas.

Much work has yet to be done in establishing quantities, but it can be accepted that there is sufficient bauxite of commercial grade to mark the discovery as one of the most important in Australia's mining history. The Queensland government has been asked to survey part of the west coast with the object of establishing a port. Special legislation in the Queensland Parliament is expected to cover the coming bauxite development. The view has been expressed that the interests of small prospectors should be protected, to provide against the squeezing out of small operators who may be engaged in prospecting for, or working, a variety of minor minerals, provided that these smaller interests do not encroach on the specific charters of the big companies.

Canada's

WITH a few exceptions, the two principal pioneers in developing towards the north in Canada have been mining and the military. The first must have economic transportation, the second is pushed through regardless of cost. Farming, diversified industry and civilized communities soon follow.

With an area of 1,300,000 square miles, the present population of Canada's Northwest Territories is about 18,000, of which about 4,000 are Indians, 7,000 Eskimos and 7,000 white men. There is not one mile of railroad in the Territories and only 130 miles of highway. The summers are warm but short, the winters much like Northern Ontario, but longer. With economic basic industries the northern half of Canada could support a large population.

By **A. HOPKINS,**

B.A.Sc., P.Eng., M.C.I.M., F.G.A.C., M.E.I.C.

A short résumé of the known and potential mineral resources in the far north, shows why it is imperative that the Federal government should aid in the establishment of roads, railways, and power plants there. The figures presented are based on published facts and forecasts.

The Athabaska oil sands are estimated to contain from 100 billion to 300 billion barrels of oil. Total known reserves of conventional fields of the world today total 191 billion barrels of which 3 billion barrels conventional are proven in Canada.

To date, most Canadian uranium produced has come from Eldorado at Great Bear Lake and at Uranium City, and by

Gunnar at the latter. Dr. W. F. Libby of the U.S. A.E.C. predicts a world annual consumption of uranium within about a decade, of from 40,000 to 100,000 tons. Canada could supply about half of this.

A lead-zinc deposit at Pine Point on the South Shore of Great Slave Lake is rated as the largest in North America. A conservative estimate is that it contains 60,000,000 tons of ore. Controlled by Consolidated Smelters and Ventures, it stands idle for lack of transport. If a \$50,000,000 railway were built there from Grimshaw, Alberta, a distance of 400

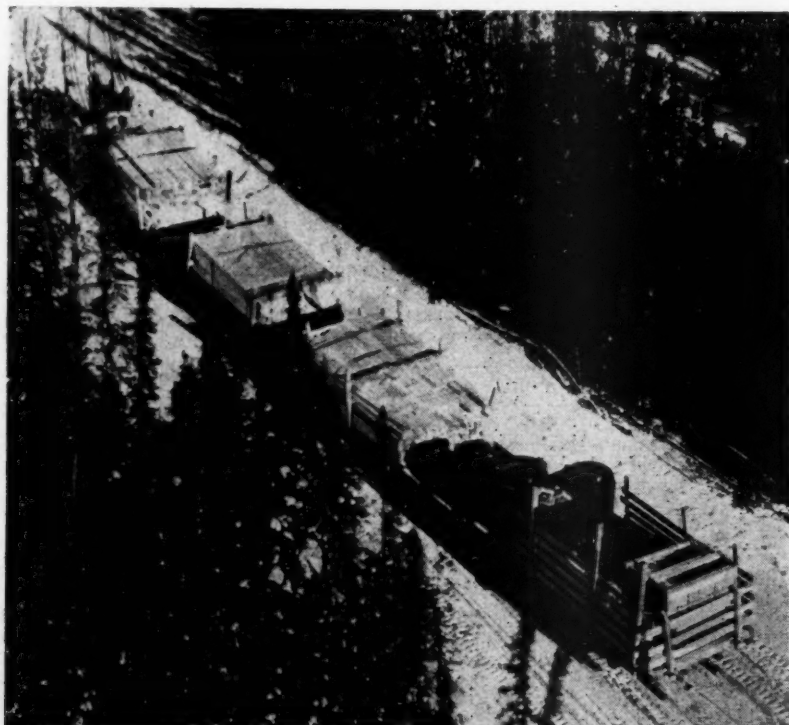
Northern

miles, production from here could eventually amount to \$100,000,000 annually.

Yellowknife produces about \$10,000,000 worth of gold annually at present, but lower costs resulting from better transportation would increase this a great deal by creating much ore out of what is now just rock. The Giant Yellowknife mine there alone has a gold-bearing zone as long as the whole of Kirkland Lake, Ontario. In the Yellowknife area are also many known but idle deposits of copper, lithium, tungsten and uranium.

In the Yukon, gold dredging is still continuing, 60 years after the great Gold Rush that stirred the world. However, other deposits there of silver, lead, zinc, asbestos, copper and nickel are being mined as at Keno Hill, and will eventually produce far more wealth than was ever realized from the Klondyke's gold.

The Moak Lake area of N. Manitoba is the largest nickel development of the world since Sudbury. Great production



At left : a "Snowball Express" tractor freight-train operating on Inco's Mystery-Moak Lakes project

At right : diagrammatic illustration of the Seven Islands iron-ore loader, at the Ungava fields in the Quebec-Labrador area

plans call for an expenditure of \$175,000,000, which is close to the complete cost of all the Blind River uranium mines together (\$190,000,000). Only a railroad would make this possible.

A few mineral concessions have already been granted to mining companies in the N.W.T. such as Inco, Kennecott Copper and Pickel Crow Mines. One of these reports 2,500,000 tons of 8 per cent copper ore indicated, and they are committed to spend \$900,000 in the next 4 years in return for exclusive prospecting rights. They say under present circumstances that they would need 100,000,000 tons of such ore to warrant production.

On the shores of Hudson's Bay, North Rankin Nickel Mines nears production, Gulf Lead Mines have explored old deposits found by early fur traders and Belcher Islands contain huge low grade iron ore deposits. Recently the Quebec government was deluged with applications for concessions in the Cape Smith - Ungava nickel belt, and they are now being granted. This zone stretches for 225 miles east and

The article presented herewith is a precis of an address delivered to the International Alumni Association in Toronto on March 19, 1957, by Mr. A. Hopkins of Hopkins Exploration Consultants.

ing on a gigantic scale, shipping to Greenland during the short shipping season and thence to Europe the whole year.

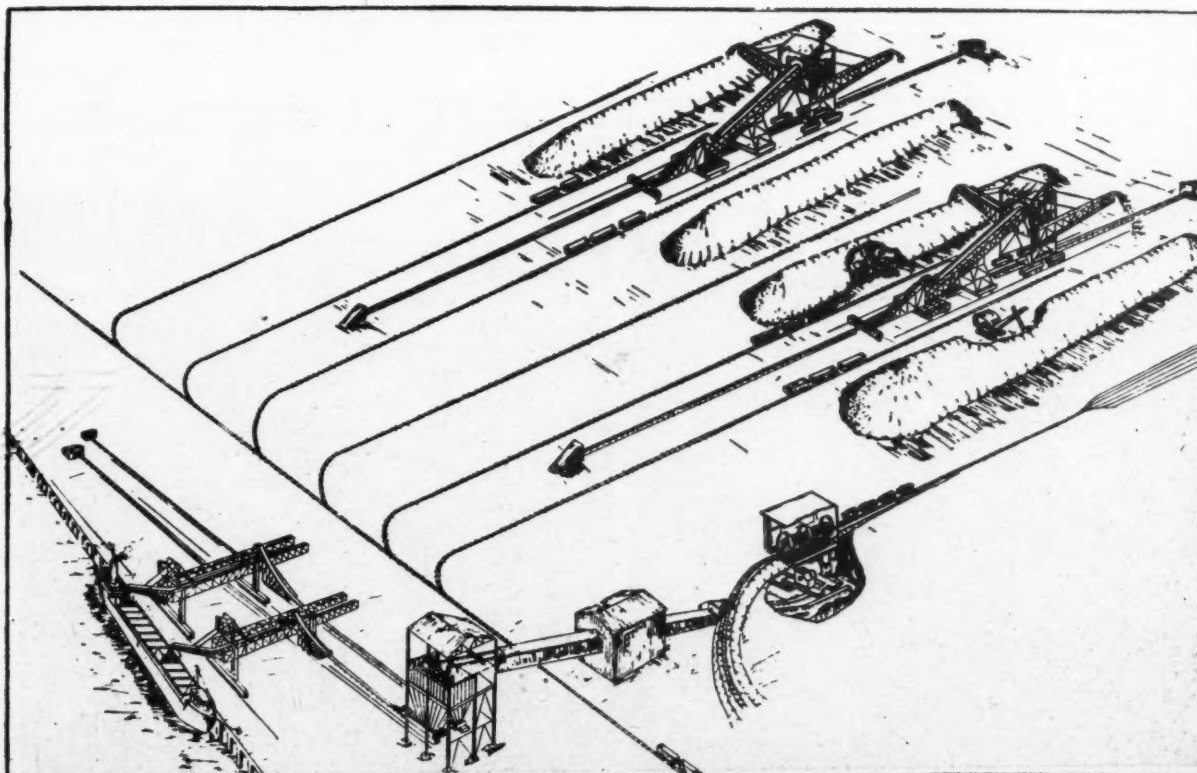
Apart from the McMurray oil tar sands and the Norman Oil Wells, coal deposits are known in the Arctic Islands. These may all be of great benefit at some future date. Small atomic power plants will probably be available in a few years for delivery to far northern points, and their uranium fuel would be delivered perhaps once annually in small packages. There are presently 13,000 H.P. being developed by hydro-electric plants near Yellowknife. Yukon and Athabaska also have small hydro stations.

A great potential in hydro electric power is available in parts of the North. The headwaters of the Yukon River at the boundary of Yukon Territory and British Columbia are at an altitude of 2000 feet, yet only 15 miles of mountainous terrain separates them from tidewater at Taku on the Alaskan panhandle. By reversing the flow of the Yukon and by tunnels through the mountains a vast power potential could be developed that could well amount to one-quarter of the present total installed hydro capacity of all Canada. Many other potential sites are known totalling about half a million horsepower, e.g., Slave River north of Ft. Fitzgerald, and the Lockhart River east of Great Slave Lake.

Frontier

west across the extreme N.W. tip of Quebec near Hudson Strait, and may be extremely important.

On the Ungava Bay shores, three iron ore companies, Oceanic, Atlantic and Consolidated Fenimore, plan iron min-



The Story of Bauxite

In Malaya

ALTHOUGH for many years deposits of bauxite have been known to exist in Malaya, relatively few of these have been found large enough or of sufficiently good quality to warrant commercial exploitation. Johore State, in the south of the peninsula, has always seemed to be the most encouraging source of this ore, and mining on a very small scale was first started in 1936.

By the end of that year four mines were being operated in Johore by Japanese concerns. The output from all of these was a meagre 36 tons. Production expanded rapidly, however, once the initial work of preparing the sites had been completed. The largest mine being worked at that time was at Batu Pahat and by 1938, the yield from this mine alone had risen to 12,531 tons, while the total amount produced in Malaya during the same year reached a figure of more than 55,000 tons.

The peak pre-war year was 1939 when production of bauxite soared to 92,256 tons, produced almost wholly by Japanese efforts.

Between 1942 and 1944, during the Japanese occupation, production rose to 225,450 tons and it was during this period that bauxite was mined for the first time in Malacca. In all, 170,000 tons of bauxite were extracted from Malacca. After the liberation production to all intents and purposes came to a standstill. A certain amount of prospecting was done, but most of the pre-war mines died a natural death.

Then in 1949 a report, issued by the Colonial Primary Products Committee, said that prospecting in Johore disclosed more than 10,000,000 tons of high-grade and marginal bauxite ore. The main site of these estimated deposits was round the south-east tip of the peninsula at Teluk Ramunia where only a short while before a static stockpile of about 40,000 tons of ore abandoned by the Japanese had been

sold to the Johore government by a syndicate, who later re-sold the ore to the Japanese.

It is this particular area that to-day is the site of Malaya's only bauxite mine—Ramunia Bauxite Ltd.—where modern heavy-duty mining equipment is operating over an area of 300 acres and catering for an ever-increasing overseas demand for high-grade bauxite. The mine is extremely isolated, there being neither road nor rail communications. To the north lies dense jungle and all contacts with the mine have to be maintained either by the company's own radio-phone link with the head office in Singapore, or else by launch from Changi Point. The mine is opencast and most of the ore is of a fairly high grade with an Al_2O_3 content of as much as 55-58 per cent.

Quantities of silica, iron and titanium occur in the ore and these can, for the most part, only be removed in the overseas treatment plants. Analysis of samples of bauxite show the following average percentages of the negative elements:

Silica: Five per cent. Some of this washes out in the mine's own wash plant. The remainder is not free and can only be removed in the alumina plants.

Iron: This varies from between 7 per cent and 15 per cent. This, too, can only be separated by special treatment.

Titanium: Approximately one per cent. This can also be removed only by special treatment.

A general view of the wash plant at Ramunia Bauxite Ltd., each shed serving the various stages of washing. The binning shed is at the foot of the hill with one of the stockpiles in the foreground. The pipeline carrying the tailings, together with the pump house, are shown at the right.



Titanium percentage in this ore is fortunately low, which is an added advantage in view of the fact that excessive titanium content affects the good electric conductivity of the finished aluminium.

Output at this mine at present averages about 260,000 tons annually, with prospecting and development plans continually being made to meet expanding overseas market requirements. Production has been on the upward trend ever since the mine opened and the following statistics show output figures since 1952:

	Production	Exports to Japan	Exports to Taiwan	Exports to Australia
1952 ...	50,000	—	—	—
1953 ...	120,000	150,000	—	—
1954 ...	180,000	140,000	40,000	—
1955 ...	290,000	200,000	40,000	50,000
1956 ...	240,000	200,000	40,000	—

The 50,000 tons exported to Australia in 1955 was ordered for a new aluminium plant set up in Tasmania.

Equipment Now In Use

The equipment being used by the mine at present includes three bulldozers, five mechanical diesel shovels each of 1½ cu. yds. capacity, and 20 five-ton trucks for transporting the bauxite to the washing plant and loading jetty. The primary wash plant is of the company's own design and similar in principle to those used in the gravel pump tin mining process. High pressure water jets—1,000 g.p.m.—play onto the bauxite moving down a perforated steel plate. The bauxite falls onto a 3-in. grizzly which grades it into sizes. The smaller lumps and fines separate, while the oversize is arrested, then crushed down to 2-in. size.

The material then passes through an 18 ft. by 6 ft. washing trommel which has a capacity of about 50 tons an hour. It is then passed over a newly-installed vibrating screen for additional washing, and finally stored in bins. The dimensions of the new Tyrock screen are 4 ft. by 10 ft. and capacity of approximately 80 tons an hour. The result is a cleaner product and an estimated increased production of 20 tons an hour.

Great care is taken in blending the mined bauxite for export. Due to the different grades found upon the mining site with their fluctuating percentages of impurities, several stockpiles of varying grades of the ore are maintained. The ideal blend is 55 per cent of Al_2O_3 and just under 5 per cent silica. In order to keep as close as possible to these ratios extensive analysis tests are carried out daily in the company's own laboratory on the site. Samples of each day's average production of 800 tons are analyzed so that a mean daily average can be obtained for each stockpile. The result is that when a stockpile reaches 10,000 tons or more, the quality throughout is easily ascertained.

The company operates a fleet of twelve lighters, each with a capacity of 100 tons. These are loaded at the jetty and towed out to ocean-going ships for loading by four tugs on contract to the firm. The company at present employs about 200 labourers, drivers and technicians, and this year, with the present labour force and equipment, production is expected to rise to 300,000 tons of washed bauxite—some 50,000 tons more than was produced in 1956. Japan is expected to take 250,000 tons, the remainder going to Taiwan.

This rise in production, compatible with steadily increasing Japanese market needs augurs well for the future of the industry in Malaya and could well mean the opening of other mines in years to come.

Continued Prosperity of U.K. Steel

CONFIDENCE in the continued prosperity and an accelerating expansion of production are the features of the annual report for 1956 which has just been issued by the British Iron and Steel Federation. Last year's production of steel rose to double the 1938 level, and for the next six years, plans have been approved which are designed to increase annual capacity by a further 7,000,000 tons.

The provision of 14 new blast furnaces, eight new or extended melting shops, and six four-high plate mill, to say nothing of many other section, slabbing and billet mills, constitutes a gigantic programme which will severely tax the financial and physical resources of the industry.

Problems of Supply

Apart from the problems of financing a capital investment at present estimated at nearly £600,000,000, and the recruitment of skilled labour, the acquisition and transport of the raw materials of the industry—coal, coke, fuel oil, iron ore and scrap—cannot fail to present immediate problems whose solution is the first condition of progress.

Last year British blast furnaces used 58,300,000 tons of raw materials to produce 13,200,000 tons of pig iron. On this basis it is estimated that the attainment of a target of 20,000,000 tons of pig iron in 1962 will call for the provision of not less than 85,000,000 tons of iron ore, coke, limestone, etc.

Obviously there must be no delay in providing for future requirements and one of the most impressive features of the Federation report is the outline of the steps which have already been taken in this direction. In the past ten years there has been no more than a negligible increase in the output of home ironstone.

Supplies of Ore

Blast furnacemen have been mainly reliant upon increased imports and it is encouraging to observe that B.I.S.C. (Ore) Ltd., which undertakes the provision of ore supplies for the whole of the industry, has pursued a far-seeing policy in the arrangement of long-term contracts. Supplementing the traditional sources of ore supplies, the Corporation has entered into long-term contracts for deliveries from Wabana (Newfoundland), Liberia, and Labrador, and has also assured a substantial share of the output of the new ore fields in Venezuela and Brazil.

The shipment of these overseas supplies, which will ultimately call for a carrying capacity of over 20,000,000 tons per annum, cannot be exposed to the vagaries and hazards of fortuitous circumstance. By the end of last year eleven specially designed ore carriers were in service and a special section of the Federation report is devoted to the detailed plans which are in process of execution for the provision of a fleet of 72 of these ships by 1962 with a total annual carrying capacity of over 10,000,000 tons. That will still leave scope for long-term chartering of other ore carriers on an extensive scale, but the number of new vessels on order is probably as large as the shipbuilding industry can handle under present circumstances.

IN the course of exploratory drilling in World War II by the U.S. Bureau of Mines under the Strategic and Critical Minerals Investigations Programme, a problem arose as to the ultimate disposal of the drill core resulting from that programme. The difficulties experienced in obtaining factual information to evaluate mineral deposits examined influenced the Bureau in a decision to catalogue and store the drill cores for future reference. These activities are described in the Bureau's *Information Circular 7777*.

A New

Recently the Bureau stations at Minneapolis and Denver were designated as the locations of permanent drill-core storage facilities. Drill cores that are retained from Bureau of Mines' mineral-exploration projects are stored at these two locations and are given preference in selecting cores for storage. Drill cores are accepted also for storage from other government agencies, State agencies, private companies, or individuals on the basis of available facilities

Drill Core

and consistent with the significance of the core in relation to Bureau of Mines' objectives and national interest. The drill cores stored at the two locations are available for inspection by any person having a legitimate interest in the mineral deposits represented by the cores.

Approximately 1,850,000 ft. of drill core can be stored in the facilities now available. Approximately 475,000 ft. of drill core is stored or scheduled for storage at Minneapolis, and 240,000 ft. of core stored or scheduled for storage at Denver. The decision to establish the core library was based on the mine-examination experience gained during the Investigations Programme. This experience showed a serious lack of reliable data from earlier exploration and development work that had been completed on the mineral deposits examined.

The advantages of permanent storage and cataloguing of drill cores were recognized by the President's Materials Policy Commission in a recommendation which states: "That the United States Geological Survey and the Bureau of Mines work out and submit to Congress a detailed programme under which a co-ordinated national system of libraries of core samples, log data, and other geologic evidence can be established and maintained in co-operation with State Mining Agencies and the Mining Industry".

Other countries have also considered the importance of recording or saving drill cores. A report on a United Nations' questionnaire indicates that several countries have enacted legislation concerning the preservation of rock samples. Countries reporting such legislation include Austria, Denmark, Germany, Lebanon, Mexico, New Zealand, Panama, Spain, the United Kingdom, and Uruguay.

The fact that the economic importance and value of a mineral deposit are subject to change imposes the requirement for periodic re-evaluation. It is readily apparent that this purpose can best be served if actual physical samples of the deposit are available for study. Although it is customary for mining companies and individuals to file reports of mine examinations that include recorded data of

work done, seldom is any systematic effort made to retain, for any great period, the drill core recovered during investigation of a mineral deposit. The drill core retained by mining companies is usually from deposits of more immediate commercial interest that are developed and mined at a relatively early date, after which the core is discarded.

The cost and the effort involved in drill core storage largely explain the fact that it is so often discarded within a short time. The immediate objective of a drilling programme is served by the inspection and analysis of the drill core recovered, leaving little incentive for retaining the actual core. However, the immediate objectives of an exploration programme may not be consistent with the criteria for evaluating a mineral deposit at some later date. The conditions and objectives at the time of an exploratory drilling project, with their influence on the thinking of personnel involved, may so direct and colour the recorded data that it may have little value or even be misleading to later evaluation of the mineral deposit based on such data.

Long-term changes in economic conditions and mineral use patterns are difficult to foresee to accurately judge the future value of a mineral deposit. Recurring emergency conditions in the world further distort projections into the future of the relative importance of a mineral deposit. The

main purpose of drill-core storage is, therefore, to provide a permanent, tangible record of mineral exploration for further evaluation and study.

When it is considered that the cost of drilling for core falls in a general range of \$2 to \$12 a foot, the core now in storage represents a large financial investment in mineral investigations.

Library

The storage of drill core offers several important advantages. The drill core provides:

- (a) A check sample against the original log and analyses.
- (b) A sample that can be examined and analyzed for new or different materials not sought in the original investigation.
- (c) A material log of formations that may be examined for geologic evidence, such as horizon markers, that may not have been noted in original examination.
- (d) Material factual evidence to substantiate or refute differences of opinion that commonly arise in interpreting written drill logs.
- (e) A guide to ground and drilling conditions that will improve the efficiency of future drilling ventures on a particular deposit.
- (f) Specimens for inspection or physical testing to evaluate possible mining conditions and future mine development.
- (g) Samples for examination and tests to determine possible mineral beneficiation methods.

A common device to reduce the expense and effort of saving and storing is selecting and retaining only relatively short lengths representative of longer sections. It was soon demonstrated that this practice was not satisfactory.

THE BRITISH INDUSTRIES FAIR

IN

1957

The British Industries Fair opens at Castle Bromwich, Birmingham, on May 6 and closes on May 17. Some of the exhibitors will display equipments of specific interest to the mining industry.

Rapid Magnetic Machines Ltd., in addition to improved examples of their products, will be exhibiting a number of new units. A conveyor elevator which automatically conveys ferrous articles magnetically, is designed to reduce handling costs and increase production. The unit moves all types of ferrous objects including stampings, metal parts, cans, nuts, bolts, etc. Also exhibited for the first time will be the manufacturers' new hopper magnet. As its name implies, this is for inclusion in hoppers, feed chutes, etc., for the extraction and removal of tramp iron.

Magnetic Rolls employing permanent magnets have now been developed for the transportation and automatic feeding of sheets, etc. These supplement the electromagnetic type which have been well proven on previous applications. The company's recently introduced coolant separator will be on view, the purpose of which is to remove ferrous contamination from all forms of suds, coolants, etc. A modified version for treating other liquids is also available.

An electro and non-electric self-cleaning drum and pulley-type separator will be on view, as will the well proven diverter unit which is approximately four times as powerful as the similar size drum or pulley. An example of the company's wide range of overband type extractors will also be shown, as will the Type 'J.Y.P.' Swarf Separator which is for the extraction of loose iron from non-ferrous swarf borings, etc.

An example of a new Tri-polar Suspension Magnet technique will be exhibited—a sure safeguard against the tramp iron which finds its way on to conveyors carrying coal, limestone and similar commodities, with the consequent disastrous effect to crushers.

The Rawlplug Co. Ltd. will show rawlplug devices to solve all types of fixing problems, and it will be recalled that the rawlplug method has already proved to have applications in the mining industry.

The Hilger and the Watts divisions of **Hilger and Watts Ltd.** will be exhibiting on one stand. The Hilger division will display optical apparatus for gauging and inspection, projectors for profiles and surfaces and other equipments. The Watts division will show projectors for checking formed components, taps, hobs and profiles of all kinds, as well as microptic measuring machines for gauge measurement and other tools.

G. A. Harvey & Co. (London) Ltd., will feature equipment for the methodical storage and efficient stock control of the modern factory. Harvey storage racks, bins and shelving are presented as an answer to a difficult problem. An extensive range of

perforated metals will be exhibited showing some of the enumerable designs required for sifting, filtering and grading such diverse products as coal and fine chemicals.

John Bedford & Sons Ltd. will display black, ground bar and hollow drill steels, T.C. tipped drill steels and bits, breaker picks, as well as other smaller, hand tools.

A section of the **Westinghouse Brake and Signal Co. Ltd.** stand will be devoted to the company's activities in the pneumatic control equipment field. To illustrate the company's developments of equipment for use in mines, a static exhibit of an electro-pneumatic control desk for a pit-top decking with mine car traverser circuit is to be shown. This desk controls decking rams and positioning catches, keps, tippler loading rams and positioning catches, compressors, pumps, and conveyors. It includes a clock and pressure gauge and also incorporates the winder and shaft signalling keys, with space for telephones on both sides. It is designed for operation from a sitting position.

A comprehensive display of the world famous Westinghouse Rectifier Equipments of the latest designs for plating and other industrial purposes will be exhibited.

Imperial Chemical Industries Ltd. will exhibit copper, brass, aluminium, titanium sheet, strip, extrusions, tube, plate and wire. Also shown will be "Kunifer" and "Alumbro" condenser tubes and "Kuterlon" copper tubing, as well as many other products.

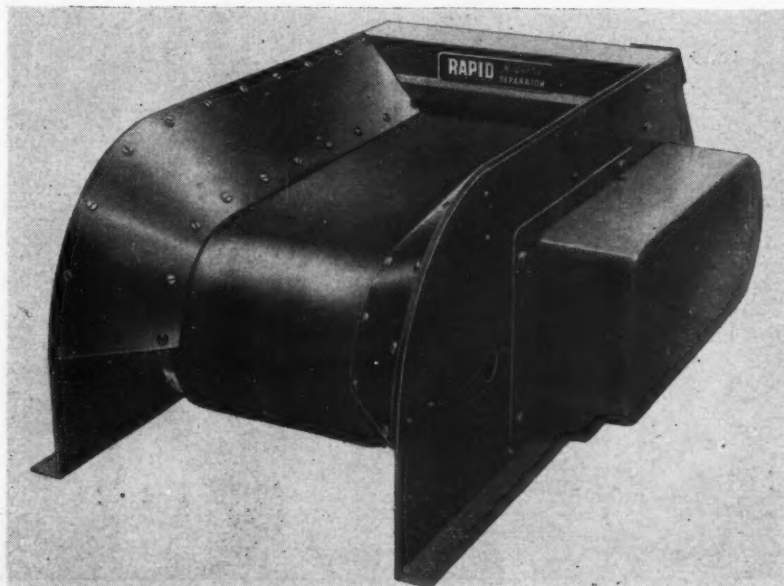
The Hub Ironworks Co. Ltd. will display earth-boring plant, well-boring machinery, earth-sampling tools, rotary boring machines and the like.

A new V-belt, the Dunlop Maxrate, will be shown by **Dunlop Rubber Co. Ltd.** for the first time. This belt is built up from three basic elements: terylene cord; a specially compounded hard base rubber designed to reduce heat built-up to a minimum; and

fabric jackets impregnated with hard-wearing rubber compounds which enclose and fully protect the body of the belt. The terylene cord, of exceptional strength for high loading, is grouped in the vicinity of the true pitch line of the belt and is heat resistant, stretch resistant, and unchangeable in length. Other equipments will be displayed on the stand.

A wide selection of examples of the use of electro-heat in industry, many in actual operation, will be seen on the stand organized jointly by the **British Electrical Development Association** and the **Midlands Electricity Board**. Some of the more interesting examples of the use of electric heating will include resistance heating dielectric heating and induction heating as applied to industrial processes, glass tube bending, ceramic tile drying, vitreous enamel paint drying, timber seasoning, die casting and metal melting.

A section of the stand will be devoted to showing methods of heating factories electrically—by means of floor warming, off-peak block storage heaters, and overhead infra-red heaters. Another section will draw attention to the Midlands Board's research service to industry with examples of case histories on how electricity has solved various industrial problems. A display headed, "Consider Electric Heating Now", will relate to the nuclear generation of electricity and will stress that atomic power will make the use of electricity for industrial heating processes more than ever indispensable.



Rapid tramp iron diverter unit, the magnetic strength of which is four times that of the equivalent size of drum or pulley

MINING MISCELLANY

According to a Press report, uranium deposits have been detected on a 3,000 ft. mountain near Narssaq in Greenland.

★

Rumours of an early take-over by Canadian interests of the Silvermines Lead and Zinc Mines at Shallee, County Tipperary, are again current.

★

The Andhra Pradesh government is to consider nationalization of mines after the establishment of the proposed State Trading Corporation for Minerals.

★

Drilling on the main group of claims at the Root Lake property of Capital Lithium Mines during 1956 indicated 2,297,000 tons averaging 1.3 per cent lithium.

★

It is intended to exploit new coalfields at Spitzbergen, Norway, at a cost of about Kr. 25,000,000. The present seams will soon be exhausted. It is expected that a new mine will start production in 1959.

★

Coff's Harbor Rutile N.L., Australia, expects to begin production of rutile by the end of May. Erection of the treatment plant is ahead of schedule. First shipment under forward contracts is due to be made in July.

★

The Chief Minister of the Federation of Malaya, Tengku Abdul Rahman, will

open the \$M.550,000 (£65,000) Research Division Headquarters and Laboratories of the Federation Mines Department at Ipoh to-morrow (Saturday). These laboratories are claimed to be the most modern and best equipped for mineralogy in South-East Asia.

★

A prospecting company will soon dig up the dying 100-year-old town of Lahat, five miles from Ipoh, North Malaya, to seek tin ore worth an estimated Straits \$3,000,000. Permission has been given to New Lahat Mines Ltd. to prospect on about 16 acres of State and private land on which Lahat is built.

PERSONAL

The following retiring directors were re-elected by shareholders at the annual meeting of The International Nickel Co. of Canada Ltd.: Mr. E. G. Baker, Mr. L. W. Douglas, Mr. J. R. Gordon, Mr. H. R. MacMillan, the Rt. Hon. Viscount Margesson, Mr. R. S. McLaughlin, Mr. H. C. F. Mockridge, Mr. T. G. Montague, Sir Ronald L. Prain, Mr. G. C. Sharp, Dr. J. F. Thompson, the Rt. Hon. Viscount Weir.

★

Mr. Fraser W. Bruce, managing director of the Northern Aluminium Company, has been appointed president of the Aluminium Company of Canada—principal subsidiary of Aluminium Limited, succeeding Mr. R. E. Powell. Mr. M. P. Weigel, Montreal, has been appointed director of operations of

Aluminium Limited. He succeeds Mr. Powell, who was re-elected a director of both Aluminium Limited, and Aluminium Company of Canada and will remain active in the management as a senior vice-president of Aluminium Limited. Field-Marshal Earl Alexander of Tunis, a director of Aluminium Limited, has also been elected a director and chairman of the Northern Aluminium Company, the principal fabricating subsidiary. Mr. S. E. Clotworthy, at present sales director, has been appointed managing director of the Northern Aluminium Company, succeeding Mr. Bruce, who returns to Canada.

★

Mr. C. B. Lang has been elected president of Dominion Steel and Coal Corporation in place of the late Mr. L. A. Forsyth. Mr. Lang has resigned as chairman and that office will remain vacant.

★

Mr. H. Scott Thompson, Mr. P. Foster and Mr. S. M. C. Glasson have been appointed additional directors of Mount Charlotte (Kalgoorlie) Gold Mines. Mr. H. Scott Thompson has been elected chairman.

★

An excellent and well illustrated reference book of roof control techniques for mining engineers has just been published by Dowty Mining Equipment Ltd. The work outlines various methods of roof support and illustrates a wide range of applications. Briefly, the book is divided into two sections, dealing respectively with support systems at conventional faces and at mechanized faces. While considering the Dowty prop as a recognized support medium at the face, it is interesting that a ceremony held on Tuesday heralded the millionth pit-prop to be produced by these manufacturers. The book, well illustrated, speaks of all the known "getting" machines and is compiled in convenient form for ready reference.

CONTRACTS AND TENDERS

The I.C.A. has announced the following future authorizations:

South Africa

Three air compressors, rotary vane type, diesel power-operated, trailer type complete with drawbar to deliver approximately 315 cu. ft. per min. at 100 lbs. p.s.i. With standard equipment. Also three Grindex Rockmaster Juniors, or equal. Also six pneumatic paving breakers. Bids to Union Tender and Supplies Board, 291 Bosman Street, P.O. Box 371, Pretoria. Closing date, May 16, 1957. Ref.: E.S.B./10865/57. Telephone enquiries, Chancery 4411, extension 738 or 771.

India

Various requirements diamond coring bits, BX, Bevel Wall AX, BXM, AXM, BX casing shoe, BX double tube reamer, BXM double tube reamer, AX double tube reamer and AXM reamer shell. Bids to Director General of Supplies and Disposals, Shahjahan Road, New Delhi. Closing date May 16, 1957. Ref.: ESB/10005/57. Telephone enquiries, Chancery 4411, extension 738 or 771.

Mr. Henry A. Longden, director-general of production, N.C.B., congratulates the company and employees after putting a laurel wreath on the 1,000,000th pit-prop to be made by Dowty Mining Equipment, Ltd., after receiving it off the production line at Ashchurch, Glos., last Tuesday. Left to right: Mr. A. W. Mills, managing director, Dowty Mining Equipment, Ltd.; Mr. H. Langford Holt, director, Dowty Mining Equipment, Ltd.; Mr. Longden; and Sir George Dowty, chairman, Dowty Group, Ltd.



Metals and Minerals

A Future "African Ruhr"?

In our issue of last week (26/4/57, p. 518), reference was made to the plans now being studied for the production of primary aluminium in the Lower Congo. M. Auguste Buisseret, Belgian Colonial Minister, has now appointed a committee of 10 international experts to prepare a blueprint for the construction of the proposed hydro-electric plant at Inga, which will be one of the largest in the world. The experts have been asked to submit their report by September. Their work will be based on four reports drawn up by three Belgian study-groups and a Swedish organization, which have recently been submitted to the Belgian Government.

It has been officially stated that the Inga project might be put into operation in less than six years, but the full development of the Inga potential—some 20,000,000 kW—will span 25 to 50 years, depending on the tempo of industrial development in the Belgian Congo, Angola and French Equatorial Africa. According to the first official estimates, Inga could provide the world's cheapest power.

It has been further stated that, apart from aluminium, this "future African Ruhr" could produce other light metals, treat ores locally, and perhaps justify the erection of a plant for isotopic separation to enrich Congo-mined uranium.

U.S. ALUMINIUM SURPLUS

The Primary Aluminium Producers and Prime Aluminium Products Committees have recommended to BDSA that no formal call be made for aluminium for the stockpile in the second half of 1957, even though a surplus of 2,000-2,500 stons of metal may develop in the U.S. Members of the two committees stated that they were opposed to a stockpile call, because the vigorous drive currently being made to promote new uses of aluminium could use up any surplus. Producers maintained that, preferably, they should be allowed to exercise their "put" options to deliver aluminium to the General Services Administration as and when surpluses might accumulate.

Offerings totalling 200,000 tons of aluminium have been made to the U.S. Government—125,000 tons by Alcoa, 42,500 tons by Kaiser and 32,500 tons by Reynolds. These should place the American industry in a much healthier position and it is considered that the steadily-growing markets for aluminium should absorb current capacity by the end of 1957.

Mr. Ralph E. Knight, president and director of research for Kaiser, described last week how research was increasing the competitive advantages of aluminium. He stated that the aluminium industry had centred its research along such major lines as problems of manufacturing costs and technological processes and methods. As an example of the value of cost and process research, he pointed out that in 1932 pig aluminium was selling for 23 c. a lb. Yet, even under the pressures of

inflation, the current price is only 25 c. a lb. This represents an increase of only 7.3 per cent. In contrast, said Mr. Knight, copper prices over the same period had advanced by 452 per cent, zinc by 368 per cent, steel by 361 per cent, and tin by 353 per cent.

Alcan has put the first of five idle Quebec potlines back in action. The remaining four, all of which had been put down as a result of low water in the Saguenay area, will be put back into operation, on a staggered basis, as quickly as possible. Alcan plans to operate at virtual capacity for the remainder of the year and will also bring a new 30,000 potline into production—approximately 85 per cent of the Canadian output goes into world trade.

The Canadian General Electric Company has announced that it will build five hydro-electric generators of record capacity for Alcan rated at 165,000 kW amperes each—the biggest known units in terms of power output. They will be for installation on the Peribonka River in northern Quebec where the Alcan organization is building a 1,000,000 h.p. hydro development to serve the company's facilities in Quebec. Delivery of the units will begin early in 1958.

SILVER REPAYMENTS

Last month the U.K. returned the final instalment of 88,000,000 fine oz. of silver borrowed from the U.S. It was recently reported that the Indian Government is returning a lend-lease loan of 172,000,000 oz. of silver obtained from the U.S. during World War II. Arrangements were made for the shipment of 50,000,000 oz. in the first instalment, of which approximately 3,000,000 oz. was shipped on April 24. The balance is to be made available in the form of old four-anna coins containing 50 per cent silver, 40 per cent copper and 4 per cent each of zinc and nickel.

The U.S. and Pakistan have reached an understanding by which 54,000 oz. of silver loaned to the latter country for coinage purposes during the war will be repaid to the U.S. Treasury.

NEW NICKEL SMELTER

Plans are progressing for a nickel smelter, which will probably be located on the property of Nickel Rim Mines Ltd., in the Sudbury Basin, Canada. Preliminary engineering data are being assembled and the programme calls for completion of the smelter by November, 1958. Broken ore reserves of Nickel Rim now exceed 400,000 tons. Milling facilities have been expanded to a point where the company is milling 1,000 tons a day. The mill will subsequently have a capacity of 1,500 tons a day. A rate of 1,200 tons a day should be reached by the end of 1957. The major portion of Nickel Rim's output has been sold for the two coming years at "most favourable prices".

U.S. TITANIUM DEMAND

U.S. demand for titanium mill products was reported to be currently in balance with supply but was expected to lag slightly during 1958, according to a report presented by Dr. R. I. Jaffee, metallurgist of the Batelle Memorial Institute, before a group of North Atlantic Treaty Organization technologists in Oslo, Norway. By 1958, production of mill products is expected to be at a rate of about 15,000 stons a year. Consumption for military aircraft will continue to decline in 1959, owing to production cuts, but new aircraft plans in the early 1960's may increase U.S. titanium output to 40,000 tons a year.

ZIRCONIUM METAL PLANT

With the opening of its new zirconium facility at Albany, Oregon, the Wah Chang Corporation became a commercial producer of reactor grade and commercial grade zirconium metal. The company now operates two plants whose total production makes it the world's largest producer of this important metal. In May, 1956, Wah Chang was appointed by the Atomic Energy Commission to operate its substantial stand-by facilities at the Bureau of Mines Electro Experimental Station in Albany. This plant will remain in operation for an indefinite period. All the zirconium produced to date at both plants is being shipped under A.E.C. instructions to various smelters. Wah Chang anticipates, however, that by July of this year it will be in a position to make quantities of the metal, reactor grade or commercial grade, available to industry on a direct sales basis. Enquiries have been received from both domestic and foreign sources.

NATAL BEACH SANDS

The extraction of ilmenite, rutile and zircon on a fairly large scale is to commence soon from deposits at Umgababa on the South Coast of Natal. A considerable amount of plant is being installed by the operating company, Umgababa Minerals Ltd., a wholly-owned subsidiary of the Anglo American group. The ilmenite production will be partially utilized by a company recently formed by African Explosives and Chemical Industries Ltd. and British Titan Products Ltd.

RESEARCH ON THORIUM

The British Non-Ferrous Metals Research Association has begun a programme of research on metallurgical problems arising from the generation of power from nuclear sources. As a first step, with the co-operation of the nuclear power consortia and the Atomic Energy Authority, work is already in progress on the metallurgical properties of thorium and thorium alloys.

ELECTROLYTIC CHROMIUM METAL

The U.S. Department of the Interior has published a technical report describing a process developed by the Bureau of Mines for producing chromium metal electrolytically. This process, which is now being used by a commercial firm, is the result of work carried on over a period of years by several research teams. Output from the commercial plant is used chiefly in super-alloys for jet engines. A copy of Report of Investigations 5322, "Electrowinning Chromium Metals," can be obtained from the Bureau of Mines, 4800 Forbes Street, Pittsburgh.

The U.S. Agriculture Department has announced the signing of a barter contract with Turkey involving the exchange of U.S. Government-owned surplus wool and other farm commodities for chrome ore worth over \$4,000,000.

BERYLLIUM ORE

Beryllium ore prices are easing and are now quoted at 215s.—225s. per 1-ton unit, f.o.b. This compares with recent quotations of around 240s.—250s. Traders state that more material is now available, particularly from South American sources.

COPPER • TIN • LEAD • ZINC

(From Our London Metal Exchange Correspondent)

The most outstanding feature of the metal markets this week was the setback in the price of zinc, following the news that America was to reconsider her future policy in regard to this metal. More immediate information contradicts this statement, which has had a steadying effect on prices. Lead, which had already shown signs of weakness, quickly followed the zinc market, but again, with the steadiness in zinc, has shown a slight improvement. Copper and tin have remained comparatively steady, with tin a little less so, owing to heavy selling in the near position. A disappearance of the backardation, at any rate for the time being, has been a noteworthy development in the case of tin.

COPPER STOCKS STILL GROWING

Whilst no startling features have emerged, certain reports from the U.S. during the past few days have rather indicated a slight upsurge of optimism. The keynote, however, is obscurity and it must always be remembered that since prices have already fallen at least £200 per ton, production interests naturally do not desire prices to decline still further, and it is not clear what action would be taken should such be the case. Stocks of copper continue to show an increase each week, and the small demand is reflected in the contango which still exists at between 15s. and 20s. per ton. This latter state of affairs should, however, encourage hedging operations which have not taken place during the long period of the "back".

In the U.S. incoming business of brass and wire mills and foundries called for the use of only 91,880 tons of copper, the smallest since July, 1956. These bookings were 23,005 tons below February and 53,017 tons less than in March, 1956. The American export price at about 30 c. per lb. seems to be keeping in line with the L.M.E. quotations and reports on the consumptive demand both from Europe and America show that trade is keeping fairly steady with no heavy selling pressure at the present time. Should prices recede still further it is quite possible that consumers will take advantage to replenish their stocks which must by now have considerably diminished. It is reported from certain influential circles that the electrical industry is likely to become much more active within the next few months, in which event correspondingly more copper will be required.

TIN "BACK" DISAPPEARS

Prices of tin have declined this week on lower Eastern advices and free selling by influential interests. The backardation has at last disappeared and indications are that a contango may exist in the near future. The stocks of tin in warehouses have increased by 155 tons to 727 tons, and reports of heavy selling in the near position have been received.

From the U.S. comes the news that the government have stopped buying tin since the long range stockpile objective was met at the end of 1956. It should still be borne in mind that at present, prices are many pounds per ton above the range at which the Buffer Stock Manager is entitled to acquire metal. Rumours still persist, however, that purchases have already been effected.

World production in February of tin in concentrates was 12,400 1 tons as against 14,400 in January, the main influence here being the fall in Bolivian output by 359 tons to 1,709 tons. World tin metal production in February was 11,900 tons as against 15,800 tons in January, the main reason for this decline being the drop in production in Malaya to 4,380 tons in February as against 6,677 tons in January. World consumption of tin was 14,100 tons in January, compared with 13,200 tons in December last. Tin plate production in the United States was 419,686 tons as against 518,461 tons in January. On Thursday morning the Eastern price was equivalent to £787½ per ton c.i.f. Europe.

ZINC FALL DEPRESSES LEAD TOO

The lead market has experienced a sharp decline, influenced to a great extent by the fall in the price of zinc and arrivals of Continental lead. As a result of this a small contango has developed. Trade in America remains quiet.

An improvement in the motor industry over here is apparent, a state of affairs which should reflect favourably on the future consumption of lead by the battery industry, normally one of the largest consumers of lead in this country.

European consumption remains steady and if the prediction by the president of the American Battery Manufacturers proves to be accurate there will be a material increase in the consumption of

lead for storage batteries this year as compared to 1956. There has been a falling off in barter transactions which formerly absorbed European supplies, and the latest news forecasts a continuation of America's stockpiling policy, at least for the present.

The news from the U.S. that buying for the nation's stockpile was due to end in a matter of two months caused a considerable decline in the price of this metal at the beginning of the week. The opinion has also been expressed that more mines in the U.S. will close unless, of course, the U.S. government decides to impose higher tariffs as a means of protection. The world level of zinc production, estimated at some 3,140,000 tons (or double the output of 1946) is also the cause of some concern amongst the U.S. producers.

Moreover, as reported here last week, the Eagle Picher Co. are closing their zinc mining and milling in the tri-state area, which action will curtail 60 per cent of the company's operations in zinc. The main reason for this has been due to the increase in stocks piling up by producers and decreasing stocks held by consumers. In the first two months of this year imports reached the level of 51,789 tons, a fact which has been the cause of some disquiet, while recoverable zinc mined domestically in the same period was 94,300 tons. Imported zinc is reported half a cent per pound cheaper than domestic metal in New York.

Earlier this week it was reported from the U.S. that the Commodity Credit Corporation had temporarily refused further offers of zinc. The temporary cessation in barter transactions was taken to mean that this was in order to allow officials to reconsider the whole position. However, the information just to hand is that the month-to-month purchases will continue, so that it would seem that time alone will tell.

Closing prices and turnovers are given in the table opposite.

BANCROFT MINES LIMITED

Mine Captain—A vacancy exists at Bancroft Mine, Northern Rhodesia for an experienced underground man, preferably with a technical background.

Experience of modern development practices and diamond drill, blast-hole stoping, or stoping of wide orebodies will be preferred.

Salary will be in the range of £127—to £134 10s.—per month, depending on experience, plus a variable copper bonus at present about 50 per cent of basic salary and a cost of living allowance at present £6 10s. per month. Leave will be at the rate of 51 days per annum. Housing and basic furniture will be provided at a rental of £5 per month. A Pension and Medical Aid Scheme is available. The outward passage of the candidate will be paid.

Applications in writing, stating age, marital status, qualifications and previous appointments held, should be addressed by airmail to:—

The Manager,
Bancroft Mines Limited,
P.O. Box 1,
Bancroft, Northern Rhodesia.

THE WEEK ON THE L.M.E

	April 25		May 2	
	<i>Buyers</i>	<i>Sellers</i>	<i>Buyers</i>	<i>Sellers</i>
COPPER				
Cash	£239½	£240	£240½	£240½
Three months ..	£240½	£241	£240½	£241
Settlement ..	£240		£240½	
Week's turnover	5,375 tons		7,225 tons	
LEAD				
Current ¼ month	£111½	£111½	£108½	£109
Three months ..	£111½	£111½	£108½	£109
Week's turnover	2,875 tons		3,550 tons	
TIN				
Cash	£777	£778	£772½	£773
Three months ..	£773½	£774	£770½	£771
Settlement ..	£778		£773	
Week's turnover	775 tons		830 tons	
ZINC				
Current ¼ month	£99½	£99½	£99½	£94
Three months ..	£95½	£95½	£90	£90½
Week's turnover	3,650 tons		9,225 tons	

Aluminium, 99.5%, £197 per ton
Antimony —
 English (99%) delivered, 10 cwt. and over £210
 per ton
 Crude (70%) £200 per ton
 Ore (60%) bases 23s. 6d./24s. 6d. nom. per unit,
 c.i.f.
Arsenic, £400 per ton
 Bismuth (min. 1 ton lots) 16s. lb. nom
Cadmium 12s. 0d. lb.
 Cerium (99% nett), £13 18s. lb delivered U.K.
 Chromium, 7s. 2d. lb.
 Cobalt, 16s.-19s. lb.

Bismuth	75% 84. 6d. lb. c.i.f.
	20 % 3. 3d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (semifriable) 48%	£17 8s. 0d. per ton c.i.f.
.. Hard Lumpy (45%)	£17 8s. 0d. per ton c.i.f.
.. Refractory 40%	£12 15s. 0d. per ton c.i.f.
.. Smalls 42%	£16 5s. 0d. per ton c.i.f.
Baluchistan	£18 15s. 0d. per ton c.i.f.
Columbite, 65% combined oxides, high grade	185s./197s. 6d. per unit
Fluorspar—	
Acid Grade, Flotated Material	£22 13s. 3d. per ton ex. works
Metallurgical (75/80% Ca F ₂)	156s. 0d. ex. works
Lithium Ore—	
Petalite min. 34% Li ₂ O	£8-£10 per ton f.o.b. Beira
Lepidolite min. 34% Li ₂ O	£8-£10 per ton f.o.b. Beira
Amblygonite basis 7% Li ₂ O	£28-£32 per ton f.o.b. Beira
Magnesite, ground calcined	£28 0s./30 0s. d/d
Magnesite Raw (ground)	£21 0s./£22 0s. d/d
Molybdenite (85% basis)	8s. 5d. nom. per lb. (f.o.b.)
Titanium Ore—	
Rutile 95/97% TiO ₂	£62/£64 per ton c.i.f. Aust'n
Ilmenite 52/54% TiO ₂	£11 per ton c.i.f. Malayan
Wolfram and Scheelite (65%)	155s./162s. 6d. per unit c.i.f.
Manganese Ore Indian	
Europe (46%-48%) basis 165s. freight plus 17½% surcharge	145d. nom. per unit c.i.f.
Manganese Ore (43%-45%)	116d. nom. per unit c.i.f.
Manganese Ore (38%-40%)	111d. nom. per unit.
	(including duty)
Vanadium —	
Fused oxide 90-95% V ₂ O ₅	£124-£134 per unit c.i.f.
Zircon Sand (Australian) (65-66% ZrO ₂)	£20. per ton c.i.f.

[illegible]

Mining Finance

New Life for R.B.H.

Profits of Rhodesia Broken Hill Development, the Northern Rhodesian lead-zinc producer, amounted to £1,300,000 against £1,500,000 in 1955 after tax and allowing for an increased appropriation of £500,000 capital expenditure against £350,000, this comfortably enabled the company to maintain dividends at a total of 1s. 3d. per unit net and leave the carry-forward usefully higher at £258,000. The trend of the current year's profits, with a background of uncertain lead and zinc prices and with probably rising costs, must be doubtful although it should be noted that the 1956 dividend was covered with a margin to spare.

Of more importance long-term to R.B.H. is the new disclosure which the chairman is now able to make about the future life prospects of this property. It may be recalled that some seven or eight years ago the then chairman forecast an estimated life of 15 years on the basis of existing ore reserves. In many quarters this was taken to mean that 15 years was the maximum expectation of the life of the property. And although this view was palpably unjustified it heavily clouded the investment status of the shares. Now, Sir Ernest Oppenheimer in his latest annual review, points out that reserves in 1948 were about 2,600,000 tons and that although there has been eight years' continuous production since that time indicated ore reserves, as the results of fresh exploration work, stand at 3,357,000 tons. "I have no doubt," he says, "that as our explorations proceed, this tonnage will be further increased." The future is, therefore, "assured".

Meanwhile, it has been necessary for Rhodesia Broken Hill to undertake schemes for the provision of adequate electric power. This has entailed fairly heavy capital expenditure appropriations and for a time will continue to do so, though the probable sale of the Iron Duke mine for £150,000 will help in this direction.

COSTS POSITION AT W. REEFS

Interest in the annual reports of the Rand gold mining companies always tends to attach mainly to the comments of the chairman and the statement of the consulting engineers since the scale of profits and dividend payments have already become public property. Western Reefs, in the Anglo American Corp'n. group, is a company operating in the Klerksdorp district of the Transvaal, the shares of which lost a certain amount of investment status a few years back when an unsuspected tax position brought the dividend back with something of a whack. On prospects, the shares at 28s. 1½d. may now probably be undervalued on merits, as no doubt several other Kaffirs are.

Costs at Western Reefs rose last year by 4s. 2d. per ton milled which compared with an average of 2s. 6d. for the gold-uranium producers as a whole. Normal inflationary factors were aggra-

vated at this mine by the greater use made of the hoisting facilities at No. 3 shaft which is shared with Vaal Reefs, the share of the expenses incurred on the running of this shaft increasing proportionately. Last year, it was also found necessary to undertake a major overhaul of the reduction plant which has been operating continuously since 1941. But while gold profits suffered a decline, those derived from uranium and acid improved tangibly owing to the increased tonnage drawn from the Vaal Reef and the bigger tonnage handled in the uranium plant.

Western Reefs' development position has always been of exceptional interest in that the mine was started on the basis of exploiting the Elsburg series but has more recently come into the picture with the Vaal Reef at a greater depth. Elsburg development fell away last year but this was offset by Vaal Reef development which resulted in ore reserves on this horizon increasing by some 500,000 tons to 1,547,000 tons out of a total ore reserve of 4,562,000 tons. In addition, there were some 9,000,000 tons of uranium-bearing slimes in the dam with an average content of 0.34 lb. per ton. The future programme aims at the speeding up of the exploitation of the north-eastern corner of the mine at depth on the Vaal Reef horizon. Dividends last year totalled 2s. 6d. per share as in each of the two preceding years.

APRIL RAND RETURNS: W. HOLDINGS SHINE

When the time comes, as many think it will sooner or later, for a sustained reversal of the present broad downward trend in the Kaffir market, there will be plenty of basic ammunition for the commentator. For several months past while the market has been wearily falling away, many of the young mines in both the Free State and the Western Transvaal have been continuing to improve their position—often by leaps and bounds. This view is further emphasized by the April Rand returns which, indeed, as we go to press, have been able to prompt a not inconsiderable, though professional, improvement in the market.

Outstanding among the O.F.S. mines has been the further appreciable advance in profits of Western Holdings. It has been appreciated for a considerable time that the plant capacity was well ahead of what the mine was able to supply. But there has been a gradual improvement in this direction from the 85,000 tons milled last September to the 98,000 tons achieved last month. Though the grade handled remained around 9.2 dwt. gold per ton last month, costs were cut from 54s. 5d. to 53s. 5d. per ton and profits rose to the new high of £302,000 compared with £287,000 in March and £268,000 in February. The progress of Western Holdings during the past year may be measured by the fact that profits in April, 1956, were £187,000.

Others to do outstandingly well last month included Free State Geduld, Buffelsfontein, Stilfontein and President

Brand. The two Cinderellas of the Free State, Lorraine and Freddie's, have continued to incur the same sort of small losses recorded in previous months.

C.P. MANGANESE EARNINGS UP

Although 1956 profits of Central Provinces Manganese were adversely affected by the continued lack of rail facilities in India, they still showed a useful advance on the previous year's earnings. The profit figure of £1,529,067 compared with £1,574,340 in 1955, but the 1956 figure was struck after allocating £225,622 to ore stock reserve. U.K. and Indian tax took £1,080,000 (£931,000). The final tax-free dividend of 16½ per cent, together with a bonus of 6½ per cent, made a total of 35 per cent tax-free for the year (same). Carry forward, after crediting £100,000 (same) from unrequired tax reserve, totalled £281,197 against £257,130.

S. CROFTY MAINTAINS DIVIDEND

The chairman's statement accompanying the 1956 report and accounts of South Crofty, the old Cornish tin producer, foreshadows an application this year for a further substantial instalment of the debenture loan. Work on the reorganization of the treatment plant last year was financed out of the company's own resources, but a further borrowing will be necessary this year under the loan agreement which was set up in 1955 for the purpose of financing the plant reorganization. Profits after tax last year amounted to £20,032 against £37,861 in 1955. A maintained dividend of 7½ per cent was declared. Development last year reached a new record and a further increase in this work is planned. Tin output was also higher but no further increase is likely until the new heavy-media separation plant is in commission.

A DREDGE SINKS

A rather laconic announcement from Central Victoria Dredging has stated that the company's dredge at the Amphitheatre property, Victoria, sank on the morning of April 28. Cause of the sinking was not known and there were no casualties among the crew. The dredge is insured against damage due to sinking. All mining operations of the company have been suspended. About 50 per cent of the issued capital is held by Western Mining Corporation.

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THE RHODESIA BROKEN HILL DEVELOPMENT COMPANY LIMITED

(Incorporated in Northern Rhodesia)

SIR ERNEST OPPENHEIMER'S REVIEW

The following are extracts from the review by the chairman, **Sir Ernest Oppenheimer**, which has been circulated with the annual reports and accounts.

The prices of lead and zinc did not fluctuate widely during the year and were higher on average than the prices during 1955. A record tonnage of 28,925 long tons of zinc was produced but the tonnage of lead at 15,200 long tons was slightly lower than the record of 16,050 tons achieved in 1955.

Costs of Production

The accumulated stocks of zinc concentrates were sold during the year for £360,000, which figure is included in the total revenue. The cost of these concentrates was, however, £320,000, including nearly £200,000 of transport costs, leaving a profit of only £40,000 from this source.

Costs of production continued to rise and in consequence the net profit for the year at £1,342,000 was only £188,000 more than in 1955.

In order to maintain lead production at a level where it would meet contractual sales, it has, in recent years, been necessary to produce zinc concentrates in excess of the capacity of the electrolytic zinc metal plant. Lead production under present operating conditions will therefore be slightly reduced to about 14,500 tons per annum, in order to avoid future accumulation of the unremunerative zinc concentrates.

The revenue from the sale of lead and zinc metal was £4,463,000 which is about £435,000 more than last year.

Expansion of Power

Last year I stated that future capital expenditure would be heavy, and £522,000 was spent during the year. Of this, £300,000 was on the expansion of hydro-electric and thermal power generating capacity. During the year the Consulting Engineers recommended that we should proceed with the construction of the Mita Hills Dam, as it is essential to maintain a steady head of water to the existing generator plant throughout the year if the full utilization of the existing plant is to be obtained. It is hoped that this regular output of power will, together with power from Mulungushi and the thermal plant at the Mine, meet all anticipated requirements of the Mine and the town of Broken Hill until 1959 or 1960.

The project which was being examined to install further generating plant has, therefore, been deferred and it is now estimated that an amount of about £850,000 will be required to build the dam wall and install the necessary transformers and transmission lines. The date of starting on the dam wall depends on our being able to complete the necessary formalities to clear the area for flooding, and on negotiations with the Broken Hill Municipality from whom the company hopes to obtain a loan of £400,000, which will materially assist in providing the capital sums required.

The capital expenditure has still to be met and it was, therefore, decided to appropriate £500,000 from profit to meet

the capital expenditure of £522,000 during the year, and to carry forward most of the amount of about £200,000 available from last year's appropriation so as to spread the burden of providing the capital required for the Mita Hills Dam and other essential projects. We were able to do this and to recommend a final dividend of 10d. per share which together with the interim dividend of 5d. makes a total of 1s. 3d. for the year, the same dividend as for 1955.

Iron Duke Mine

Last year I referred to the possibility of disposing of the Company's Iron Duke pyrites mine. This property is a very small mine near Salisbury with a small ore reserve capable of producing some 70,000 tons of pyrites a year. Even if contracts for the supply of pyrites to consumers in Southern Rhodesia were secured, the operations at the mine would result in only a small annual profit for the Company and it is more-over too far from Broken Hill for its operations to be economically conducted. Negotiations for the sale of the

property were therefore continued during the year.

It is hoped that a price of £150,000 will be obtained. In this event, this amount will be usefully employed towards meeting the capital expenditure to which I have referred.

The production of cadmium started during the year, and about 52 tons were produced mostly from accumulated stocks. Normal production in future is expected to be about two tons per month.

Mine's Life Extended

The known life of the Mine is continually being extended by the exploration work being carried out. I recall that in 1948 the ore reserve was 2,618,000 tons, and in 1949 the Chairman at the time stated that the Mine had at least 15 years' life. Since then the Mine has continued to produce for 8 years and the proved and indicated ore reserves now stand at 3,357,000 short tons of ore. I have no doubt that as our explorations proceed this tonnage will be further increased. The future is therefore assured, and although it is probable that the price of the principal metals produced will be subjected to the normal influences which affect the metal markets, there are indications that prices will remain at a level which will continue to provide a satisfactory profit on our operations.

WESTERN REEFS EXPLORATION AND DEVELOPMENT COMPANY LIMITED

(Incorporated in the Union of South Africa)

INCREASED URANIUM PROFIT

The following are extracts from the review by the Chairman, **Mr. John W. Shilling**, which has been circulated with the annual reports and accounts:—

During 1956 the revenue derived from gold mining operations carried on by your company was £3,705,921. This was £332,174 higher than the revenue for the previous year and was mainly attributable to the improvement in yield from 3.80dwt. per ton milled in 1955 to 4.10dwt. in 1956. The inexorable rise in working costs robbed the company of the benefit of this change in its fortunes. Working costs for 1956 were £351,680 higher than those for 1955. In the result, the working profit from gold at £615,147 was £19,506 lower than that for 1955.

In contrast to the downward trend of gold profits, the profit derived from the production of uranium and acid increased by £82,392 to £1,710,128 in 1956. This is partly due to the increase in tonnage drawn from the Vaal reef horizon and partly to the increase in the total tonnage treated in the uranium plant.

Appropriations

The total working profit for the year has been dealt with as follows:—

Total working profit	£2,325,275
Less—Excess of sundry expenditure over sundry revenue	122,881
	2,202,394
Less—Appropriations other than for dividends	1,337,779
Net surplus for 1956	864,615

Add—Unappropriated profit brought forward from 1955	319,919
	1,184,534
Less—Dividends Nos. 30 and 31	875,000
Unappropriated profit carried forward to 1957	309,534

The total of the instalments paid during 1956 under the uranium loan agreements was £676,728. Of this, £174,893 was in respect of interest. The balance of £501,835 was in respect of capital redemption and was one of the items for which profits had to be appropriated. Since capital repayments and interest are met in equal quarterly instalments over the uranium contract period, as the years pass, the interest portion of the instalments will grow less as the capital portion grows larger.

The other major items for which profits had to be appropriated were Government's share of profits and tax, totalling £636,619, the capital expenditure of £86,500 to which I referred earlier, and the redemption of the last of the debentures of £100,000 issued in favour of the National Finance Corporation of South Africa.

Operations

At 90,948 feet, the total footage developed during 1956 was 3,931 feet more than that accomplished in 1955. The decrease of 7,157 feet developed on the Elsburg reef series within the exist-

ing mining lease area was more than offset by the increase of 10,904 feet developed on the Elsburg reef series in the Goedgenoeg and Nooitgedacht areas and the small increase on the Vaal reef horizon. On the Elsburg reef series, both within and outside the lease area, there was a decrease in the percentage payable and in gold values. Uranium values were about the same. On the Vaal reef horizon, gold values showed a

slight decrease but there was an improvement in the percentage payable. In the result, by the end of 1956 the ore reserve had increased by 186,400 tons to 4,562,300 tons with a gold value of 5.62dwt. per ton and a uranium value of .441 lb. per ton over a stoping width of 44.74 inches—equivalent to 251 inch-dwt. and 19.72 inch-lb. respectively. Included in the ore reserve is the tonnage of payable ore blocked out by develop-

ment in the Goedgenoeg area over which the company has been granted a lease. The ore reserve on the Vaal reef horizon, also included in the total, has increased from 1,010,100 to 1,547,200 tons. In addition to the ore reserve of 4,562,300 tons of payable ore blocked out by development at the end of 1956, there were 9,050,000 tons of uranium bearing slimes on the slimes dam, with an average uranium value of .340 lb. per ton.

UNION CORPORATION, LIMITED

(Incorporated in the Union of South Africa)

ABRIDGED REPORT OF THE DIRECTORS FOR YEAR 1956

After providing £486,100 for United Kingdom taxation the profit for the year is £1,973,473, plus £392,103 brought forward, making a total of £2,365,576. The Directors have placed £1,000,000 to General Reserve Account and £175,000 to the credit of Exploration Reserve Account and have declared a final dividend of 2s. 0d. United Kingdom currency per share, less United Kingdom Income Tax, absorbing £534,750, leaving £388,451 to be carried forward.

With a view to conserving the cash resources of the Corporation the Directors, as indicated above, have transferred £1,000,000 to General Reserve Account bringing the balance on that Account to £2,300,000 at the end of the year.

The final dividend of 2s. 0d. per share less tax was declared on 20th March, 1957, and makes, with the interim dividend of 1s. 0d. per share less tax, a total dividend of 3s. 0d. per share less tax for the year compared with 2s. 9d. per share less tax for the previous year.

Holdings of shares, debentures and other securities have been taken into the Accounts at cost or under but in no case above the market value of December 31st last, or, where no market price exists, above the Directors' valuation. The Directors, as on other occasions, have thought it expedient to write down the book cost of certain holdings below both cost and market price to allow for the wasting nature of a substantial part of the Corporation's portfolio. To this end they have charged the Profit and Loss Account with £150,000.

A copy of the Corporation's Annual Trade Cycles Chart, revised to date, is enclosed with the Report.

GOLD MINING INTERESTS

Summary of the operating results for the past year of the Companies operating in the Transvaal and Orange Free State in which the Corporation is largely concerned:

	East Geduld Mines Limited	Geduld Proprietary Mines Limited	The Grootvlei Proprietary Mines Limited	Marievale Consolidated Mines Limited	St. Helena Gold Mines Limited	Van Dyk Consolidated Mines Limited
Tons Milled..	1,720,000	1,245,000	2,344,000	855,000	1,312,000	953,000
Yield per ton, dwt.	6.18	3.17	4.31	5.25	5.81	3.24
Working Costs per ton	32s. 10d.	34s. 3d.	30s. 5d.	41s. 2d.	40s. 11d.	40s. 2d.
Working Profit per ton	44s. 11d.	5s. 8d.	23s. 9d.	24s. 11d.	32s. 1d.	40s. 8d.
Total Working Profit	£3,861,000	£354,000	£2,781,000	£1,065,000	£2,106,000	£30,000
Net Profit	£1,918,000	£1,026,000	£1,399,000	£572,000	£2,039,000	£51,000
Dividends:—						
Total	£1,912,000	£1,041,000	£1,382,000	£506,000	—	—
Per stock unit or share	4s. 3d.	14s. 3d.	2s. 5d.	2s. 3d.	—	—

The net profit figures include revenue from other sources. Thus East Geduld Mines' dividend income in 1956 on its stockholding in The Grootvlei Proprietary Mines was £64,960 and Geduld Proprietary Mines' dividend income in 1956 on its stockholdings in East Geduld Mines and The Grootvlei Proprietary Mines was £746,347.

ST. HELENA GOLD MINES.—At the end of February, 1957, the new vertical shaft (No. 2) had reached a depth of 4,175 feet below surface, the Basal Reef having been intersected at 4,097 feet. The shaft is being continued to 5,500 feet. The extension to the Reduction Plant was completed during the year, increasing its nominal capacity to 125,000 tons per month. In March of this year the Company declared a further dividend of 9d. per share.

WINKELHAAK MINES.—During the year the two small vertical shafts were sunk to depths of 1,210 and 1,472 feet respectively and sinking of the ancillary ventilation winzes was completed. Development from these winzes commenced in August and by the year-end a total of 3,765 feet had been driven. Of this footage 1,075 feet were on Kimberley Reef and sampled, disclosing 470 feet or 44 per cent payable averaging 484 inch-dwt. The majority of the necessary buildings, machinery and plant for shaft sinking and development work on this new property have been completed and good progress has been made with the provision of the necessary accommodation for European and Native employees.

THE WITTHOK PROPRIETARY COMPANY.—During the year this Company, in which the Corporation continues to hold a substantial interest, sold to the S.A. Land and Exploration Company, Limited, its entire fixed property on the Farm Witthok No. 7, district Brakpan, consisting of 2,200 morgen of Freehold Land and 2,628 morgen of Mineral Rights. The consideration payable is £437,500. The purchaser has also refunded to the Company expenditure incurred by it on prospecting operations amounting to £87,500.

Interests in Gold Mining Companies not under the administration of the Corporation:

STILFONTEIN GOLD MINING COMPANY.—There was a further increase in profits from gold and uranium production during the year and two dividends totalling 1s. 0d. per share were declared. The ore reserves at 31st December last were estimated to amount to 4,286,000 tons with a value of 9.54 dwt. per ton over a stoping width of 38.1 inches.

WESTERN HOLDINGS.—During the year ended 30th September, 1956, the rate of milling increased substantially and there was an improvement in the grade of ore milled. The working profit was £2,302,445 and two dividends totalling 3s. 6d. per share were declared. A further dividend of 2s. 0d. per share was declared in March of this year.

OTHER MINING INTERESTS

SAN FRANCISCO MINES OF MEXICO.—This Company earned a Working Profit of £1,497,000 in the year ended 30th September, 1956, and paid a dividend of 4s. 6d. per 10s. Stock unit in respect of that year compared with 4s. 0d. per unit for the previous year. The mill again treated a record tonnage and ore reserves at the end of the year were estimated at 5,073,000 metric tons.

CHROME MINES OF SOUTH AFRICA.—As a result of an improved demand for the Company's higher grade ores and a small increase in railings and shipments, the net profit for the year ended 30th June, 1956, was £127,721, or more than double that for the previous year. The Company declared a maiden dividend of 6d. per share in September last.

The Corporation is also interested, *inter alia*, in the following Company:

TSUMEB CORPORATION.—The Corporation's interest in this Company is approximately 9 per cent. The net profit for the year ended 30th June, 1956, was £8,021,916 compared with £4,089,103 for the previous year, and dividends totalling 35s. 0d. per share were declared. Dividends totalling 35s. 0d. per share have been declared during the first nine months of the current financial year.

OTHER INTERESTS

BAY HALL TRUST.—The net profit for 1956 was £132,417. A dividend of 16 per cent less tax was declared compared with 15 per cent less tax for the previous year. The sum of £25,000 was placed to General Reserve and the amount carried forward increased from £119,727 to £130,144. The Trust's investments as at 31st December last showed an appreciation of £889,378 over book cost of £1,921,831. The 3½ per cent Series "A" Registered Debentures were redeemed at par at the end of the year.

BRITISH ENKA.—The net profit for 1955 was £236,565 compared with £305,777 in 1954. After adding £41,123 in respect of taxation and other provisions made in previous years and no longer required, transferring £200,000 to General Reserve and paying a dividend of 8 per cent involving a net outlay of £86,250, £180,907 remained to be carried forward. The results of operations in 1956 have not yet been published.

SOUTH AFRICAN PULP AND PAPER INDUSTRIES.—After providing for taxation and depreciation the net profit for the year ended 31st December, 1956, was £489,078 as compared with £309,352 for the previous year. A dividend of 2s. 0d. per share has been declared. The Company's output of both white and kraft papers increased during the year and efforts are being made further to increase efficiencies and output. As part of the latter programme a medium sized paper machine has been ordered for the Tugela Mill.

EXPLORATION

In the Kinross area further drilling was carried out on that portion of the holdings of Capital Mining Areas and Acacia Mines which had previously yielded encouraging results. This work has given some further encouragement and is continuing. As indicated last year, however, the amount of drilling involved is considerable and will take some time to complete.

In addition the Corporation is actively engaged in other exploration in the Union of South Africa and elsewhere.

Copies of the full Report and Accounts can be obtained on application at the London Office, Princes House, 95 Gresham Street, E.C.2.

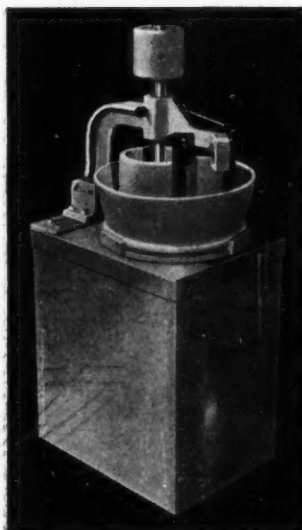
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VAAL REEFS EXPLORATION AND MINING COMPANY LIMITED

(Incorporated in the Union of South Africa)

FAVOURABLE DIVIDEND PROSPECT

The following are extracts from the review by the chairman, **Mr. John W. Shilling**, which has been circulated with the annual reports and accounts.

The production of gold and uranium was commenced at the company's mine at the beginning of May, 1956.

For the eight months during which the mine was in production in 1956, the total working profit was £1,186,748, of which £750,444 was derived from gold mining and £436,304 from the production of uranium.

The total working profit for the eight months has been dealt with as follows:—

Total working profit	£1,186,748
Less—	
Excess of sundry expenditure over sundry revenue	52,750
	£1,133,998
Less—	
Appropriations for—	
Directors' special remuneration in terms of the Articles	£8,000
Dividend No. 1	500,000
	508,000
Balance appropriated for capital expenditure	£625,998

During 1957, the capital expenditure on shaft sinking development and equipment is estimated at £1,150,000. The capital expenditure on the uranium plant and buildings, including the cost of the steam-heating equipment, is estimated at £218,000. Having regard to the rate at which gold and uranium profits are currently being earned and the fact that

the fluctuating loan from Anglo American Corporation of South Africa, Limited, has only to be redeemed by December 31, 1961, the prospect for an improvement in the dividend for 1957 appears favourable.

Satisfactory Development

During the year, the opening up of the mine continued satisfactorily. At 55,575 feet, the total footage advanced was about the same as that accomplished in 1955. Of the 18,125 feet sampled, 88.2 per cent was payable, giving an average gold value equivalent to 629 inch-dwt. and an average uranium value equivalent to 46.70 inch-lb., which compare favourably with the values encountered in payable development during 1955. All the reef development during 1956 was done from No. 3 Joint Shaft through which all stope tonnage destined for the mill was hoisted. A limited amount of development work was done at No. 1 Shaft after it was commissioned in September, 1956. At the end of 1956, the ore reserve was estimated to be 1,480,400 tons with a gold value of 10.38 dwt. and a uranium value of 0.766 lb. per ton.

Having regard to the depth at which stoping operations had to be commenced and the narrow width of the Vaal reef in the area, the tonnage milled during the initial eight months of production is considered satisfactory. Provided conditions remain favourable, it is hoped that the gold reduction plant will be operating to its capacity of 65,000 tons per month by the end of 1957 or early in 1958. In anticipation of the continued rise in tonnage, extensions to increase the capacity of the gold reduction plant to 75,000 tons per month are now under construction.

Publications Received

The Yearbook of the British Standards Institution has just been published. As usual, 400 pages of this 480 page publication are devoted to a complete numerical list of the British Standards and Codes of Practice current on January 1, 1957. These total approximately 3,000.

Copies of the *B.S.I. Yearbook*, which is an essential reference work to users of British Standards, have been sent free to all the Institution's subscribing membership, who may purchase additional copies at the published price of 15s. less members' discount. Non-members of the Institution may buy at the published price plus 1s. 6d. for postage and packing.

Apart from its main purpose as a reference directory to all current British Standards, *The Yearbook* contains much additional information about B.S.I. and the services it offers.

Other information covers lists of addresses in the United Kingdom and overseas where complete reference sets of all British Standards can be consulted, while *The Yearbook* also contains a comprehensive index in which all standards are listed according to subject.

A review of *The Canadian Mineral Industry, 1954* has been published by the Department of Mines and Technical Surveys Mines Branch, Ottawa. Price \$1.

GEOLOGIST required by Mining Company in West Africa for field investigations. Tours of service 12-18 months. Salary according to qualifications and experience. Write, giving full details, experience etc., stating age, married or single, to Box 601, The Mining Journal Limited, 15 Wilson Street, Moorgate, London, E.C.2.

REPRESENTATIVE. Manufacturers of Mining Accessories (Detonator Cases, etc.) & Protective Clothing wish to appoint a Representative to visit the various offices of the N.C.B. to discuss at appropriate level the supply of mining equipment. Applicants must have a good engineering background and a sound knowledge of the technical requirements of Mining and Quarrying Authorities. The post, which is pensionable and offers good prospects, will carry a basic salary and commission with travelling allowances etc. Write full details to Box MJ 819 L.P.E., 55 St. Martin's Lane, London, W.C.2.

PROSPECTOR

Required by an alluvial mining company in Sierra Leone. Applicants must have had previous bush experience and a mining degree or diploma is desirable. Basic salary £1,080 p.a., plus overseas allowance £360 p.a. and marriage allowance £180 p.a. There is also a bush allowance and a generous provident and bonus fund and a pension and life assurance scheme. Free passages to and from Africa. Tours normally twelve months followed by twelve weeks' leave. Married accommodation not available. Write, giving details of age, education, qualifications and experience to W.5, Mine Employment Department, Selection Trust Limited, Masons Avenue, London, E.C.2.

SENIOR AND JUNIOR MINING ENGINEERS required for field work in West Africa by Mining Company. Tours of service 12-18 months. Salary according to qualifications and experience. Write, giving full details, experience, etc., stating age, married or single, to Box 602, The Mining Journal Limited, 15 Wilson Street, Moorgate, London, E.C.2.

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The Association will be pleased to furnish information concerning mining companies in Canada to which enquiries about employment opportunities can be directed.

Enquiries would be welcomed also from trained and well-qualified mechanics, machinists, electricians and tradesmen.

